AMENDMENTS TO THE CLAIMS:

Please amend the claims to read as indicated herein.

1. (currently amended) An ~~o~~optical network element for use in a node of an optical network ~~including~~that includes a plurality of nodes ~~which~~that are interconnected so as to be capable of carrying traffic between selected nodes, the optical network element comprising ~~of~~:

~~1.1~~ a local network management system ~~(11) including~~having means for building up a supervisory connection ~~(10.1)~~ between the optical network element of a first node of said plurality of nodes and at least a network element of a ~~further~~second node of said plurality of nodes of the optical network~~;. characterized in that~~,

~~1.2~~ wherein the local network management system ~~(11) is installed to~~ supports an arbitrary network topology and ~~to~~ builds up ~~a~~the supervisory connection ~~(10.1)~~ to at least one predetermined other node of the plurality of nodes of the network so ~~as~~that the network element ~~could~~can be integrated in an optical network with arbitrary topology,

wherein the supervisory connection is a redundant connection through two or more paths, and

wherein the local network management system monitors the status of all paths of the redundant supervisory connection, and establishes an alternative route for a specific supervisory connection in the event of an impairment of the specific supervisory connection.

2. (currently amended) The ~~o~~optical network element according to claim 1, ~~characterized in that~~wherein the local network management system ~~(11)~~ provides self healing of the

supervisory connection ~~(10.1) in the case of~~for an impairment of the supervisory connection~~ (10.1)~~.

3. (currently amended) The ~~O~~optical network element according to claim~~s~~ 1~~ or 2~~, ~~characterized in that the local network management system (11) comprises of~~further comprising a software module associated with the network management system, ~~which~~that acts as a node manager ~~(100)~~ and includes ~~one or more of the following~~a software agent~~s~~ selected from the group consisting of:

~~—~~a start-up manager~~ (101)~~,

~~—~~a process, thread and session manager~~ (102)~~,

~~—~~a supervisory channel manager~~ (103)~~,

~~—~~a hardware devices manager~~ (104)~~,

~~—~~a status, fault, and events monitor~~ (105)~~,

~~—~~a database system manager~~ (106)~~,

~~—~~at least one user interface~~s, especially GUI, console, TL1 (107)~~, and

~~-~~a system resources and functions manager~~ (108)~~, and any combinations thereof.

4. (currently amended) The ~~O~~optical network element according to ~~one of the~~ claim~~s~~ 1~~ to 3~~, ~~characterized in that~~wherein the local network management system ~~(11) has the flexibility to~~can be configured by standard software protocols~~, especially by OSPF and/or MPLS~~.

5. (currently amended) The ~~O~~optical network element according to ~~one of the~~ claim~~s~~ 1~~ to 4~~, ~~characterized in that~~wherein the local network management system ~~(11) is built up to~~automatically discover~~s~~ network elements of adjacent network nodes of said plurality of nodes and ~~to~~ exchange~~s~~ Link State

Advertisement with the ~~same~~adjacent network elements of the adjacent network nodes of said plurality of nodes.

6. (currently amended) The ~~o~~Optical network element according to ~~one of~~ claim~~s~~ 1~~ to 5~~, ~~characterized in that the network element comprises of~~further comprising:

~~6.1~~ at least one back-plane ~~with~~including a plurality of electrical transmission lines running across the back-plane and a plurality of electrical terminals connected to the plurality of electrical transmission lines;

~~6.2~~ a plurality of line-card slices having line-card slice electrical terminals, wherein each line-card slice ~~being attached~~is attached to the back-plane~~ directly or in the form of a plug-in module such,~~ so that the line-card slice electrical terminals ~~of the line-card slice~~ are electrically connected to ~~selected ones~~the electrical terminals of the plurality of electrical terminals of the back-plane~~, with~~;

~~6.2. 1 at least one of the line-card slices comprising of~~ at least one optical receiver associated with at least one of the plurality of line-card slices for receiving ~~of~~ optical signals from the network;

~~and~~ at least one opto-electrical converter integrated in or optically connected to the optical receiver with electrical terminals of the at least one opto-electrical converter~~ and~~;

~~6.2. 2 at least one of the line-card slices comprising of~~ at least one optical transmitter associated with at least one of the plurality of line-card slices for transmitting ~~of~~ optical signals to the network;

~~and~~ at least one electro-optical converter integrated in or optically connected to the optical transmitter with electrical terminals of the at least one opto-electrical converter; and

at least one supervisory card plugged to the back-plane capable of functions selected from the group consisting of transmitting supervisory signals, processing supervisory signals, and a combination thereof,

~~6.3~~ wherein ~~various or all~~at least one of the ~~said~~ electrical terminals of said plurality of electrical terminals are ~~implemented in form of~~ switch terminals that provide selected and reconfigurable electrical interconnections among components of at the least one line-card slice selected from the group consisting of ~~various of~~ the ~~at least one~~ receiver, the transmitter, ~~and/or~~ the converter ~~from one single line-card slice or from different ones~~, and any combination thereof,

wherein the interconnections are accomplished by devices selected from the group consisting of an ~~using~~ electrical switche~~s~~ ~~or~~ and at least one electrical cross-connect~~.~~, and

~~6.4 at least a supervisory card plugged to the back-plane for transmittingand/or processing of supervisory signals; whereby~~

~~6.5~~ wherein the supervisory card is electrically connected via the electrical transmission lines of the back-plane to ~~a predetermined~~one of said plurality of line-card slices by a connection selected from the group consisting of direct~~ly~~ connection ~~or~~and ~~through~~ a cross-connect.

7. (currently amended) The ~~O~~optical network element according to claim 6, ~~characterized in that the network element~~ further comprisinge~~s~~ ~~of~~ a node PC~~, especially in form of an plug-in card,~~ that is plugged to the back-plane, ~~which~~that provides and/or receives an electrical supervisory signal~~,~~ that is transmitted to or from the supervisory card.

8. (currently amended) The ~~O~~optical network element

according to claims ~~6 or~~ 7, ~~characterized in that the supervisory card transmits and/or receives an electrical supervisory signal, that is received and/or transmitted by a~~wherein the node PC is connected to the network as a standalone computer sub-system.

9. (currently amended) The ~~O~~optical network element according to ~~one or more of the preceding claims~~claim 1, ~~characterized in that~~wherein the supervisory connection ~~(10.1)~~ provides at least a part of an in-band supervisory data by using electrical multiplexing and demultiplexing of the supervisory data with client's data, carried by the optical network.

10. (currently amended) The ~~O~~optical network element according to ~~one or more of the preceding claims, characterized in that~~ claim 1, wherein the supervisory connection ~~(10.1)~~ provides at least a part of an out-of-band supervisory data multiplexed onto or demultiplexed from one or more optical fiber links of the optical network by ~~means of~~ a device selected from the group consisting of a WDM coupler ~~or~~and a filter.

11. (currently amended) An ~~O~~optical network that includes~~ing~~ a plurality of nodes ~~which~~that are interconnected so as to be capable of carrying traffic between selected nodes, comprising:

~~of~~ a plurality of network elements according to ~~one of the preceding claims and further comprising:~~claim 1;

~~11.1~~ a network management system carried out by ~~one or more~~at least one of the local network management systems ~~(11)~~ of the network elements; and

~~11.2~~ supervisory connections ~~(10.1)~~ between predetermined network elements.

12. (currently amended) The ~~O~~optical network according to claim 11, ~~characterized in that~~wherein the network management system provides ~~the~~ establishment of a direct logical supervisory connection between any desired pair of nodes of said plurality of nodes interconnected by ~~a~~the supervisory connection ~~(10.1)~~.

13. (currently amended) The ~~O~~optical network according to claim 12, ~~characterized in that one or more~~wherein at least one of the direct logical supervisory connections are carried at least in part by ~~means of~~ a technique selected from the group consisting of time division multiplexing ~~and/or~~, statistical multiplexing, and a combination thereof, over a single physical supervisory connection between a pair of nodes.

14. (currently amended) The ~~O~~optical network according to ~~one of~~ claim~~s~~ 11 ~~to 13~~, ~~characterized in that~~wherein the network management system provides ~~at least one of the following~~ a function~~s~~ selected from the group consisting of:

~~-~~hardware fault ~~and/or software error~~ detection on all of the supervisory connections,

software error detection on all of the supervisory connections,

~~-~~auto-recovery of the supervisory connections ~~(10.1)~~,

~~-~~fault-tolerant ~~and/or redundant~~ supervisory connections,

redundant supervisory connections,

~~-~~automatic discovery of nodes of the ~~Network~~optical network, and

any combinations thereof.

15. (currently amended) A method of providing a supervisory

network in an optical network ~~with~~having an arbitrary network topology ~~including~~that includes a plurality of nodes ~~which~~that are interconnected so as to be capable of carrying traffic between selected nodes, the method comprising ~~the steps of~~:

~~15.1~~ automatically discovering~~y~~ ~~of~~ the network topology; and

~~15.2~~ establishing ~~of~~ redundant supervisory connections ~~(10.1)~~ between predetermined nodes of said plurality of nodes of the network;

monitoring the status of all paths of the redundant supervisory connection; and

establishing an alternative route for a specific supervisory connection in the event of an impairment of the specific supervisory connection.

16. (currently amended) The ~~M~~method according to claim 15, ~~characterized in that~~wherein each node of the plurality of nodes of the network ~~comprises of~~ includes a local network management system ~~(11), especially comprising of at least one node manager (100)~~, ~~whereby~~wherein the local network management system ~~(11)~~ of each of said plurality of nodes communicates with the local network management system ~~(11)~~ of adjacent nodes of said plurality of nodes and exchanges Link State Advertisements~~, such~~ so that each node of said plurality of nodes discovers all of ~~its~~ the adjacent nodes of said plurality of nodes and by utilizing the exchanged Link State Advertisements a routing table is generated that is stored in ~~one, several, or all~~at least one of the plurality of nodes.

17. (currently amended) ~~A~~The method according to claim 16, ~~characterized in that~~wherein the node manager ~~(100)~~ of each node of said plurality of nodes executes a single OSPF,

~~whereby~~wherein the OSPF in each node of said plurality of nodes ~~is configured to~~ communicates with the node manager ~~(100)~~ of the adjacent nodes of said plurality of nodes so that the OSPF converges on the topology of the network.

18. (currently amended) ~~A~~The method according to ~~one of~~ claims 15 ~~to 17~~, ~~characterized in that~~further comprising monitoring the status of the supervisory connections ~~is monitored, especially by OSPF~~, and configuring alternative routes in the event of link failure ~~alternative routes are configured~~.

19. (currently amended) ~~A~~The method according to ~~one of~~ claims 15 ~~to 18~~, ~~characterized in that~~further comprising:

~~19.1 any~~sending supervisory data that is carried by the optical network for use in ~~the~~a supervisory management layer of the network ~~is sent~~ in the form of messages through ~~one or several or possibly all~~at least one available redundant connections from a sending end to a receiving end of the network;

~~19.2~~ giving each message ~~is given~~ a sequence number; and

19.3 discarding duplicate messages on the receiving end ~~the duplicate messages are discarded~~ and passing only one of ~~the~~ several arriving messages ~~is passed~~ on to the supervisory management layer.

20. (currently amended) ~~A~~The method according to ~~one of~~ claims 16 ~~to 19~~, ~~characterized in that~~wherein the network management is carried out by ~~a~~the node manager ~~(100)~~ present in the local management systems ~~(11)~~ in ~~each~~at least one node ~~or in one or more nodes~~ of the network.

21. (currently amended) ~~A~~The method according to ~~one of~~ claim~~s~~ 15 ~~to 20~~, ~~characterized in that~~further comprising carrying out a function on all supervisory connections, wherein the function is selected from the group consisting of hardware fault detection, ~~and/or~~ software error detection, and a combination thereof ~~is carried out on all supervisory connections (10.1)~~.

22. (currently amended) ~~A~~The method according to ~~one of~~ claim~~s~~ 15 ~~to 21~~, ~~characterized in that~~further comprising carrying out a function on all supervisory connections, wherein the function is selected from the group consisting of auto-recovery ~~or~~and self-healing ~~is carried out on all supervisory connections~~.

23. (currently amended) ~~A~~The method according to ~~one of~~ claim~~s~~ 15 ~~to 22~~, further comprising the ~~further~~ steps of:

~~23.1~~ monitoring ~~the~~a status of each supervisory connection by sending keep-alive messages at predetermined intervals of time between the ~~respective interconnected~~predetermined nodes and by resending reply-messages on receiving of a keep-alive message; and

~~23.2 the~~ closing down ~~of~~ the supervisory connection between the ~~respective~~predetermined nodes in the event that ~~a~~the reply-message in response to ~~a~~the keep-alive message is not received within a predetermined time period.

24. (currently amended) ~~A~~The method according to claim 23, further comprising the step of automatically re-establishing a new connection between the ~~respective~~predetermined nodes via an alternative connection path.

25. (currently amended) ~~A~~The method according to ~~one of~~ claim~~s~~ 15~~ to 24~~, ~~characterized in that~~further comprising storing information concerning the network status in the local network management system of at least one predetermined node, wherein the information is selected from a group consisting of predetermined information, ~~and/or~~ real time information, and a combination thereof~~ concerning the network status is stored in the local network management system (11) of at least one predetermined node~~.

Please add the following claims, newly numbered as claims 26 through 30.

26. (new) The optical network element according to claim 3, wherein the at least one user interface is selected from the group consisting of GUI, console and TL1.

27. (new) The optical network element according to claim 4, wherein the standard software protocol is selected from the group consisting of OSPF, MPLS, and a combination thereof.

28. (new) The optical network element according to claim 6, wherein each line-card slice is connected to the back-plane by an attachment selected from the group consisting of direct attachment and a plug-in module.

29. (new) The method according to claim 16, wherein the local network management system includes at least one node manager.

30. (new) The method according to claim 18, wherein monitoring the status of the supervisory connections is

accomplished by OSPF.